

THE INCIDENCE OF GIARDIA INTESTINALIS IN STOOL SAMPLES TAKEN FROM CHILDREN

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Abstract

Giardia intestinalis is the first protozoan parasite seen and occupies a leading place among the protozoa that affects humans. It is part of the order of Diplomonadida or Diplozoa, the Hexamitidae family.

Giardiasis is one of the most common intestinal infections of a parasitic nature encountered in humans and spread all over the world, both in developed countries and in developing countries.

Clinically, the disease is characterized by acute, subacute and chronic evolution, nausea, abdominal cramps, diarrhea, meteorism, steatore, malabsorption, and less commonly by chills, fever, cholecistopathy and weight loss.

The transmission of the disease is done on a fecal-orally way, directly from one person to another through dirty hands, or indirectly by ingestion of cysts from water and contaminated food.

The risk factors identified as important for the spread of *Giardia intestinalis* infections include high environmental contamination with fecal matter, lack of potable water, education and inadequate housing conditions, overcrowding and high population density as well as sources of infection represented by animals.

Children are the most exposed category to the contracting a clinical infection with *Giardia*.

Key words: *Giardia intestinalis*, parasitic intestinal disease.

INTRODUCTION

Giardia (lambliaza) is a parasitic disease with intestinal localization caused by a flagellate protozoan, *Giardia intestinalis*, which is characterized clinically by acute, subacute and chronic evolution, nausea, abdominal cramps, diarrhea, meteorism, steatore, malabsorption and more sore throat, fever, cholecystopathy and weight loss. (Barzoi, D., S. Meica et al., 1999)

Giardia was first noticed in 1681 by Anthony van Leeuwenhoek in his feces. The first detailed description of the parasite was made just two centuries later by Lambl (1859). (Palmer, S.R., E.J.L. Soulsby et al., 2005)

Giardia intestinalis is the first protozoan parasite seen and occupies a leading place among the protozoa that affects humans. (Barzoi, D., S. Meica et al., 1999)

Giardia intestinalis also called *Giardia duodenalis*, *Giardia lamblia*, or *Giardia enterica* is a prozator that belongs to the order Diplomonadida or

Diplozoa, the Hexamitidae family. The parasite develops after a direct and simple biological cycle similar to most intestinal protozoa. In its evolution there are two forms: the trophozoite or the vegetative form of the parasite and the cyst. (Barzoi, D., S. Meica et al., 1999)

The transmission of the disease is done on a fecal-orally way, directly from one person to another through dirty hands, or indirectly by ingestion of cysts from water and contaminated food. The main reservoir of parasites is represented by humans and sick, asymptomatic animals. Cysts elimination through faeces is done intermittently. (Barzoi, D., S. Meica et al., 1999). Therefore, in order to make a correct determination of the presence of the parasite or the carrier state, three samples of faeces collected on non-consecutive days are required. (Palmer, S.R., E.J.L. Soulsby et al., 2005)

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MATERIAL AND METHOD

The present study was conducted at a kindergarten in Oradea, where more cases of diarrhea occurred in children, accompanied by abdominal cramps. The study included all children registered with this kindergarten as well as auxiliary staff (educators, carers). The number of cases infected with *Giardia* was recorded, out of the total number of cases considered and the results obtained in children were interpreted.

Three faece samples have been collected from each patient every 2-3 days. In the case of children, the samples were collected from the spontaneously released stool in a special container (without growth medium) with the help of a spatula by their parents. The stool samples were collected from different areas of the fecal bowl without filling the container. The containers were properly labeled and taken to the laboratory for the copro-parasitological exam.

In the laboratory after the macroscopic examination of the contents of each container, it was passed on to performe the microscopic preparations. These were done by placing the faeces on a microscope blade mixed with Lugol solution and coating them with a lamella. Microscopic preparations were examined on the optical microscope with the 20x objective and the 40x objective.

Identification of the parasite in the examined preparations was made on the basis of its peculiarities, namely the pear shape longitudinally cut

with 2 nuclei and 4 pairs of flagella of the trophozoite, and the ovoid or ellipsoidal shape with nuclei and flagella inside of the cyst, as well based on their yellow-brown color.

RESULTS AND DISCUSSION

After the data centralization, we have reached the following results: For each of the 3 samplings, there were collected 45 samples of children's stool, totaling 135 samples. Of the 135 samples collected, 70 were positive for Giardia, thus: at the first sampling of the total of 45 samples, 15 were positive of which in 5 samples the trophozoite form was identified and in 10 samples only the cyst form was identified. At the second sampling of the total of 45 samples, 24 were positive, of which in 8 samples the trophozoite form was identified and in 16 samples only the cyst form was identified. At the third sampling of the total of 45 samples, 31 were positive, of which in 9 samples the trophozoite form was identified and in 22 samples only the cyst form was identified. (Table 1 and Fig.1)

Table 1

Incidence of the positive stool samples for Giardia intestinalis, of the total of the stool samples collected.

Number of samplings	Total number of samplings	Positive stool samples for Giardia	Stool samples in which the trophozoite form was identified	Stool samples in which the cystic form was identified
First sampling	45	15	5	10
Second sampling	45	24	8	16
Third sampling	45	31	9	22

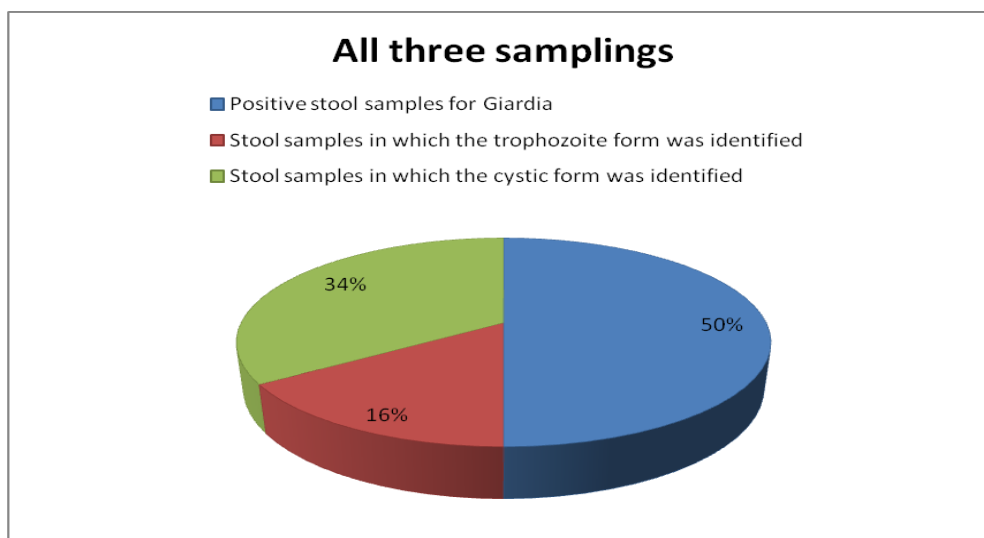


Fig. 1. Incidence of the positive stool samples for *Giardia intestinalis*, expressed as a percentage

Regarding the age of patients, analyzing the obtained data, it was found that *Giardia intestinalis* is more common in children aged 3 to 4 years.

At the first sampling, of the total of 15 positive stool samples, 9 samples were from the age group 3-4 years, 4 from the age group 4-5 years and 2 from the age group 5-6 years.

At the second sampling, of the total of 24 positive stool samples, 15 samples were from the age group 3-4 years, 5 from the age group 4-5 years and 4 from the age group 5-6 years.

At the third sampling, of the total of 31 positive stool samples, 20 samples were from the age group 3-4 years, 6 from the age group 4-5 years and 5 from the age group 5-6 years. (Table 2 and Fig. 2)

Table 2

Incidence of the positive stool samples for *Giardia intestinalis*, depending on age

Number of samplings	Positive stool samples for <i>Giardia</i>	Age group 3-4 years	Age group 4-5 years	Age group 5-6 years
First sampling	15	9	4	2
Second sampling	24	15	5	4
Third sampling	31	20	6	5

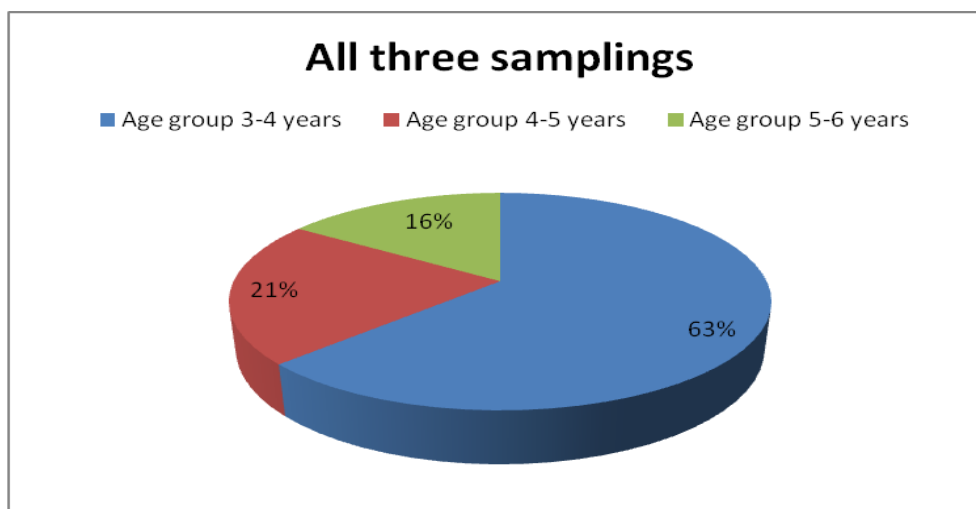


Fig. 2. Incidence of the positive stool samples for *Giardia intestinalis*, depending on age

The treatment of giardiasis was made with a range of medicine available such as quinacrine, nitroimidazoles (tinidazole), furazolidone, albendazole.

CONCLUSIONS

The high risk groups for *Giardia* infection include the inhabitants from the underdeveloped countries or disadvantaged groups in developed countries. Giardiasis is one of the common causes of acute or persistent diarrhea in underdeveloped countries where it is a major health problem.

The infection evolves inversely proportional to the socio-economic status and is increased in regions where water reserves are low or nonexistent, and sanitation and hygiene measures are poor.

The risk groups also include children in nurseries, kindergartens, preschool children and children in orphanages.

Giardia is responsible for a significant number of diarrhea episodes in kindergartens, where giardiasis occurs as an epidemic either alone or as an infection associated with other intestinal pathogens. The major factors involved in epidemics in these institutions are the presence of young children who do not know how to use the toilet, the contamination of their hands, the objects of common use in classes and the lack of measures to combat infections.

The combating measures designed to reduce the high rates of *Giardia* infection are general hygiene and health education related to: faecal-oral transmission, water quality, hand washing, food handling, personal hygiene improvement, individual medical treatment.

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